

IMAGE FORMING DEVICE

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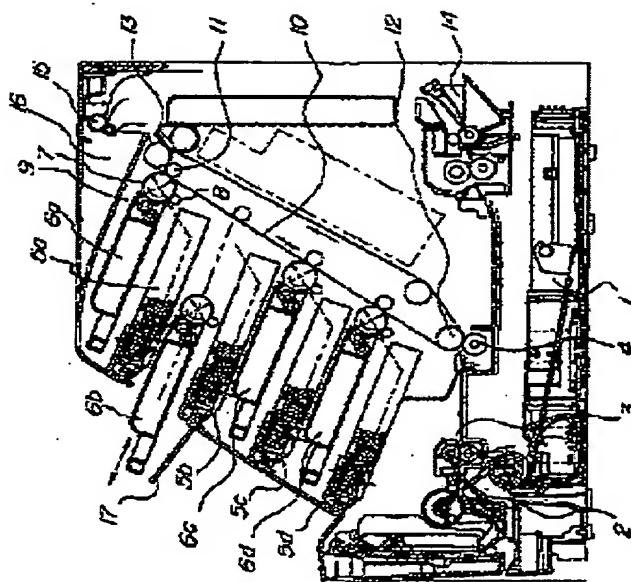
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Abstract of JP2001249601

PROBLEM TO BE SOLVED: To enable the exchange of an image carrier, a process cartridge or the like with a simple constitution without separating belts or making units movable, such as a exposure means requiring the feed of an electric power or a signal line, and to realize cost reduction and improvement in usability. **SOLUTION:** The image forming device has a plurality of image carriers 7 (process cartridge 6) attachable to and detachable from the main body of the image forming device and a plurality of exposure means 5 to expose each image carrier surface, disposed and fixed on the main body of the image forming device corresponding to each image carrier 7. Each image carrier 7 is detachable from the side where a corresponding exposure means 5 is disposed in the direction which intersects nearly perpendicularly with the direction of the rotary shaft, without moving the exposure means 5 with respect to the main body of the image forming device.



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【特許請求の範囲】

【請求項1】 画像形成装置本体に対して着脱可能な複数の像担持体と、

前記各像担持体に対応して画像形成装置本体に固定配置され、各像担持体表面を露光する複数の露光手段と、を有し、

前記各像担持体は、前記露光手段を画像形成装置本体に対して移動させることなく、回転軸方向と略直交する方向であり且つ対応した露光手段が配置された側から着脱可能であることを特徴とする画像形成装置。

【請求項2】 前記像担持体は、少なくとも現像手段を一体に有するプロセスカートリッジに含まれ、該プロセスカートリッジが画像形成装置本体に対して着脱可能であることを特徴とする請求項1に記載の画像形成装置。

【請求項3】 前記像担持体の脱着時は、各像担持体と対向し該像担持体に形成された像を担持する中間転写体移動しない構成であることを特徴とする請求項1に記載の画像形成装置。

【請求項4】 前記各露光手段は、これに対応する像担持体の位置決め部分を形成されてなることを特徴とする請求項1に記載の画像形成装置。

【請求項5】 前記各露光手段は、隣接して配設される露光手段の位置決め部分を形成されてなることを特徴とする請求項1に記載の画像形成装置。

【請求項6】 前記露光手段及びこれに対応した像担持体を有する複数の画像形成部は、装置上部から下部に向けて階段状に配置されてなることを特徴とする請求項1に記載の画像形成装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、露光手段やこれに対応する像担持体等からなる複数の画像形成部を備えた画像形成装置に関するものである。

【0002】

【従来の技術】近年、より高速印字可能なカラープリンタの要望が高まり、以下に示すような複数の画像形成部を配置したカラー画像形成装置が実用化されている。

【0003】図5及び図6に第1の従来例を示す。媒体静電吸着搬送ベルト101が水平に配置され、その上面部に沿って並列に、像担持体103及び現像器104からなる複数の画像形成部(以下プロセスカートリッジ102(K:ブラック、Y:イエロー、C:シアン、M:マゼンタ))が着脱可能に設けられ、各像担持体103に対応して露光手段(LED)105が配設されている。これら露光手段105は装置本体上部に開閉可能に設けられた外装カバー106の開動作により該カバー106と共に前記像担持体103より図6に示す如く分離される構成となっている。この構成では、前記各プロセスカートリッジ102は前記外装カバー106の開状態において、装置上面より脱着される。

【0004】図7及び図8に第2の従来例を示す。中間

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転写ベルト201(若しくは媒体静電吸着搬送ベルト)が水平に配置され、その上面部に沿って並列に、像担持体203及び現像器204からなる複数の画像形成部(以下プロセスカートリッジ202)が設けられ、各像担持体203に対応して露光手段(レーザービームスキャナ)205が装置本体に固定されている。図8に示すように、装置本体の一方の側板206には、前記プロセスカートリッジ202の脱着のための開口部207が設けられており、更に前記開口部207を塞ぐと共に前記プロセスカートリッジ202の位置決め且つ保持部を有するドア部材208が開閉可能に設けられている。この構成では、前記ベルト201が前記各像担持体202から離間されてから、前記各プロセスカートリッジ202は像担持体203の長手方向(図8中矢印方向)に水平に装置本体より脱着される。

【0005】

【発明が解決しようとする課題】しかしながら、上記第1の従来例では、装置本体に開閉に設けられた外装カバー106と一体で開閉される露光手段(LED)105への電源及び信号線を供給しなければならずコストアップとなる。また、各プロセスカートリッジの交換の際にベルト101が露出してしまい、交換操作時に該ベルト101を傷付ける等の問題がある。

【0006】また、上記第2の従来例では、露光手段205は装置本体に固定されているため、各プロセスカートリッジの交換時には該プロセスカートリッジ202の像担持体203とベルト201を離間する必要があり、コストアップとなる。また、像担持体202の位置決め保持基準となる一方の側板206を開口(開口部207)することによってプロセスカートリッジ202の脱着を可能とする構成であるため、位置決め精度の低下、保持剛性の低下、脱着時のユーザビリティの低下等の問題がある。

【0007】そこで、本発明は、上記課題に鑑みてなされたものであり、その目的とするところは、ベルトを離間したり、或いは電力や信号線の供給が必要な露光手段等のユニットを可動とすることなく、簡易な構成でプロセスカートリッジ等の画像形成部の交換を可能とし、コストダウンやユーザビリティの向上を図ることにある。

【0008】

【課題を解決するための手段】上記目的を達成するための本発明の代表的な構成は、画像形成装置本体に対して着脱可能な複数の像担持体と、前記各像担持体に対応して画像形成装置本体に固定配置され、各像担持体表面を露光する複数の露光手段と、を有し、前記各像担持体は、前記露光手段を画像形成装置本体に対して移動させることなく、回転軸方向と略直交する方向であり且つ対応した露光手段が配置された側から着脱可能であることを特徴とする。

【0009】更に具体的には、例えば、前記像担持体は、少なくとも現像手段を一体に有するプロセスカート

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リッジに含まれ、該プロセスカートリッジが画像形成装置本体に対して着脱可能であることを特徴とする。

【0010】また更に、前記像担持体の脱着時は、各像担持体と対向し該像担持体に形成された像を担持する中間転写体が移動しない構成であることを特徴とする。

【0011】上記構成によれば、像担持体と対向したベルト等の中間転写体を離間したり、或いは電力や信号線の供給が必要な露光手段等のユニットを可動とすることなく、簡易な構成で像担持体、或いはこれを含むプロセスカートリッジの交換が可能であり、コストダウンやユーザビリティの向上を図ることが可能である。また、その際の開口も小さく、前記ベルト等の中間転写体が露出することもない。

【0012】また、前記各露光手段は、これに対応する像担持体の位置決め部分を形成されてなるので、露光手段単体で該露光手段と像担持体間の調整が可能であり、位置決め精度の向上、装置全体組立時の調整不要が図れる。

【0013】また、前記各露光手段は、隣接して配設される露光手段の位置決め部分を形成されてなるので、各露光手段間の位置関係が露光手段自体で決められ、該露光手段やこれに対応する像担持体等からなる各画像形成部間の精度向上、装置全体組立時の調整不要が図れる。

【0014】また、前記露光手段及びこれに対応した像担持体を有する複数の画像形成部は、装置上部から下部に向けて階段状に配置されてなるので、各像担持体（或いは像担持体を含むプロセスカートリッジの交換時に上部又は下部の画像形成部が邪魔になることがなく、容易な交換が可能となる。

【0015】

【発明の実施の形態】以下、図面を参照して、本発明を適用した画像形成装置の一実施形態について詳細に説明する。

【0016】〔第1実施形態〕図1を参照して、本発明の第1実施形態に係る画像形成装置について詳しく説明する。図1は、第1実施形態に係る画像形成装置の概略構成図である。

【0017】給紙カセット1にセットされた記録シート等の記録媒体は、ピックアップ部材2により1枚ずつ送り出される。この記録媒体はレジストローラ部3により、その斜行を補正された後、二次転写部に搬送される。

【0018】画像形成部において、露光手段5a、5b、5c、5dは中間転写ベルト10の一方の面に図1に示すように配置され、各露光手段5a、5b、5c、5dに対応してプロセスカートリッジ6a、6b、6c、6dが設けられる。各プロセスカートリッジ6a、6b、6c、6dにおいて、像担持体7は、一次帯電部材8により帯電され、露光手段5により潜像が形成され、現像部材9により現像像化される。

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【0019】このようにして各画像形成部において形成された複数色のトナー画像は、各像担持体7と対向した一次転写部材11により前記中間転写ベルト10上に順次重ね転写される。この中間転写ベルト10に重ねて転写され形成された多色トナー画像は、前述した二次転写部における二次転写部材4により、記録媒体上に二次転写される。

【0020】ここで、前記中間転写ベルト10上の二次転写残トナーは、ベルトクリーニング部13により、回収される。

【0021】また、前記中間転写ベルト10はベルト駆動ローラ12により、図1の矢印方向に回転駆動される。

【0022】前記中間転写ベルト10上の多色トナー画像が一括転写された記録媒体は、定着部14で定着され、排紙部15により装置上部の排紙積載部16に排出される。

【0023】前記各像担持体7に対応して配置された複数の露光手段5a、5b、5c、5dは、それぞれ画像形成装置本体に対して固定されている。そして、前記像担持体7を有する各プロセスカートリッジ6a、6b、6c、6dは、それぞれ前記露光手段5が画像形成装置本体に固定されたままの状態、回転中心である軸方向と直交する方向（図1中矢印方向）であり且つ対応した露光手段5が配置された側から着脱可能となっている。

【0024】また、前記像担持体7を有するプロセスカートリッジ6の脱着時は、各像担持体7と対向し該像担持体7に形成された像を担持する中間転写ベルト10が移動しない構成となっている。

【0025】即ち、本実施形態では、図1に示すように、前記プロセスカートリッジ6は各プロセスカートリッジ毎に設けられた開閉ドア17から、露光手段5を移動することなく、且つ中間転写ベルト10を移動することなく、独立で脱着可能となっている。

【0026】上述したように、本実施形態によれば、像担持体7を有する各プロセスカートリッジ6a、6b、6c、6dは、それぞれ露光手段5a、5b、5c、5dを画像形成装置本体に対して移動させることなく、回転軸方向と略直交する方向（図1中矢印方向）であり且つ対応した露光手段5が配置された側から着脱可能となっているので、像担持体7と対向した中間転写ベルト10を離間したり、或いは電力や信号線の供給が必要な露光手段5等のユニットを可動とすることなく、簡易な構成で像担持体7を有するプロセスカートリッジ6の交換が可能であり、コストダウンやユーザビリティの向上を図ることが可能である。また、その際の開口も小さく、前記中間転写ベルト10が露出することなく、信頼性の向上にもつながる。

【0027】また、本実施形態では、図1に示すように、前記露光手段5と前記プロセスカートリッジ6からなる複数の画像形成部が、装置上部から下部に向けて階段状に配置されており、下段のプロセスカートリッジ6

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の脱着時に上段の画像形成部が邪魔にならないようになっている。

【0028】尚、本実施形態では、図1に示すように、画像形成部及び前記中間転写ベルト10が斜めに配されているが、これに限定する必要はなく、その角度は必要に応じて適宜設定すれば（垂直でも水平でも）よい。

【0029】〔第2実施形態〕図2を参照して、本発明の第2実施形態に係る画像形成装置について詳しく説明する。図2は、第2実施形態に係る画像形成装置の概略構成図である。尚、前述した実施形態と同様の機能を有する部材には同一符号を付し、詳しい説明は省略する。

【0030】図2に示す第2実施形態に係る画像形成装置では、各色毎の画像形成部は、中間転写体ベルト10の左右に配置される。そして、各露光手段5a、5b、5c、5dは第1実施形態と同様に装置本体に固定されており、各プロセスカートリッジ6a、6b、6c、6dは各々独立に図2中矢印方向への脱着が可能となっている。

【0031】尚、本実施形態では、画像形成部を中間転写ベルト10の左右に2セットずつ配した構成を例示しているが、これに限定されるものではなく、例えば3対1等でもよい。その際に、例えば使用量の多いことが想定される黒色の画像形成部を1セット側に配し、該黒色の画像形成部の容量を他の3つ（イエロー、マゼンタ、シアン）のものより大きくしてもよい。

【0032】〔第3実施形態〕図3を参照して、本発明の第3実施形態に係る画像形成装置について詳しく説明する。図3は、第3実施形態に係る画像形成装置の要部構成図である。尚、前述した実施形態と同様の機能を有する部材には同一符号を付し、詳しい説明は省略する。

【0033】図3に示すように、第3実施形態では、各露光手段5には、それぞれ、これに対応するプロセスカートリッジ6の像担持体7が位置決めされる位置決め部50が設けられている。ここで、露光手段5は、そのユニット単体で、位置決め部50に像担持体7が位置決めされることを前提として、そのレーザーの照射位置等が調整される。これにより、露光手段5と像担持体7の高精度な位置決めが可能となり、更に装置全体組立時の調整も不要となる。

【0034】〔第4実施形態〕図4を参照して、本発明の第4実施形態に係る画像形成装置について詳しく説明する。図4は、第4実施形態に係る画像形成装置の概略構成図である。尚、前述した実施形態と同様の機能を有する部材には同一符号を付し、詳しい説明は省略する。

【0035】図4に示すように、第4実施形態では、各露光手段5には、それぞれ、これに対応するプロセスカートリッジ6の像担持体7が位置決めされる位置決め部50が設けられている。また、各露光手段5には、それぞれ、隣接して設けられる他の露光手段5との位置決めを行う位置決め部51、52が設けられている。これにより、

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各露光手段5間の相対的な位置精度の向上が可能となる。更に、前述した実施形態と同様に、露光手段5と像担持体7間の高精度な位置決めが可能となり、装置全体組立時の調整も不要となる。

【0036】〔他の実施形態〕前述した実施形態では、各像担持体の対向位置に配置された部材が、各像担持体に形成された像を担持する中間転写体（中間転写ベルト）である場合を例示したが、これに限定されるものではなく、例えば各像担持体に形成された像を記録媒体に順次重ねて転写するために、記録媒体を担持搬送する記録媒体担持体（静電吸着搬送ベルト等）を用いた画像形成装置に本発明を適用しても同様の効果が期待できる。

【0037】また前述した実施形態では、画像形成装置としてプリンタを例示したが、本発明はこれに限定されるものではなく、例えば複写機、ファクシミリ、或いはこれらの機能が組み合わされた複合機等の他の画像形成装置であつても良く、該画像形成装置に本発明を適用することにより同様の効果を得ることができる。

【0038】また前述した実施形態では、画像形成装置に対して着脱自在なプロセスカートリッジとして、像担持体と、これに作用するプロセス手段としての帯電手段、現像手段を一体に有するプロセスカートリッジを例示したが、本発明はこれに限定されるものではない。例えば、前記構成から帯電手段を除いたプロセスカートリッジ、或いはクリーニング手段を加えたプロセスカートリッジなどの他の構成のプロセスカートリッジであつても良く、該プロセスカートリッジを着脱自在に備えた画像形成装置に本発明を適用することにより同様の効果を得ることができる。

【0039】更には像担持体単体が着脱可能な構成の装置にあつても本発明を適用することにより同様の効果を得ることができる。

【0040】

【発明の効果】以上説明したように、本発明によれば、各像担持体は、これに対応した露光手段が画像形成装置本体に固定されたままの状態、回転中心である軸方向と直交する方向であり且つ対応した露光手段が配置された側から着脱可能であるので、例えば像担持体と対向したベルト等の中間転写体を離間したり、或いは電力や信号線の供給が必要な露光手段等のユニットを可動とすることなく、簡易な構成で像担持体（或いはこれを含むプロセスカートリッジ）の交換が可能であり、コストダウンやユーザビリティの向上を図ることができる。また、その際の開口も小さく、前記ベルト等の中間転写体が露出することもなく、信頼性の向上にもつながる。

【0041】また、各露光手段は、これに対応する像担持体の位置決め部分を形成されてなるので、露光手段単体で該露光手段と像担持体間の調整が可能であり、位置決め精度の向上、装置全体組立時の調整不要が図れ、印字精度（画質）の向上やコストダウンに効果がある。

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【0042】また、各露光手段は、隣接して配設される露光手段の位置決め部分を形成されてなるので、各露光手段間の位置関係が露光手段自体で決められ、該露光手段やこれに対応する像担持体等からなる各画像形成部間の精度向上、装置全体組立時の調整不要が図れ、印字精度（画質）の向上やコストダウンに効果がある。

【0043】また、露光手段及びこれに対応した像担持体を有する複数の画像形成部は、装置上部から下部に向けて階段状に配置されてなるので、各像担持体（或いは像担持体を含むプロセスカートリッジ）の交換時に上部又は下部の画像形成部が邪魔になることがなく、容易な交換が可能となり、ユーザビリティの向上に効果がある。

【図面の簡単な説明】

【図1】第1実施形態に係る画像形成装置の概略構成を示す模式断面図

【図2】第2実施形態に係る画像形成装置の概略構成を示す模式断面図

【図3】第3実施形態に係る画像形成装置の要部構成を示す模式断面図

【図4】第4実施形態に係る画像形成装置の要部構成を示す模式断面図

【図5】第1の従来例に係る画像形成装置の説明図

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【図6】第1の従来例に係る画像形成装置の説明図

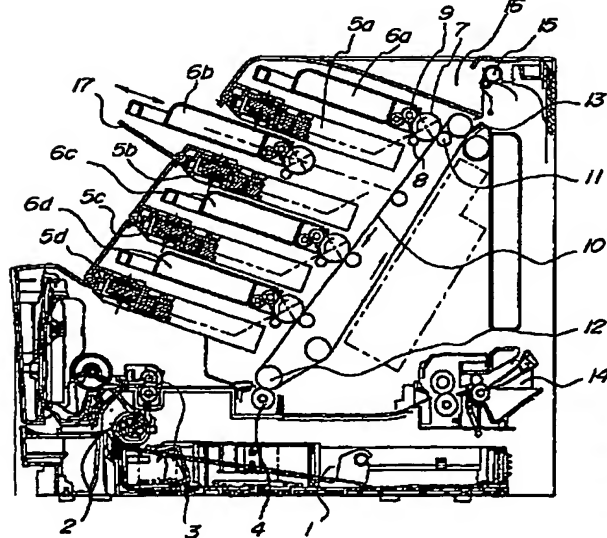
【図7】第2の従来例に係る画像形成装置の説明図

【図8】第2の従来例に係る画像形成装置の説明図

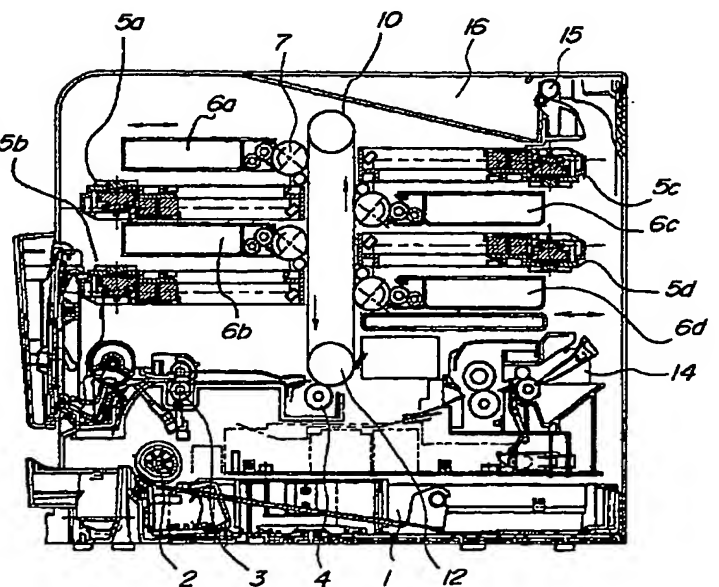
【符号の説明】

- 1 …給紙カセット
- 2 …ピックアップ部材
- 3 …レジストローラ部
- 4 …二次転写部材
- 5 a, 5 b, 5 c, 5 d …露光手段
- 6 a, 6 b, 6 c, 6 d …プロセスカートリッジ
- 7 …像担持体
- 8 …一次帯電部材
- 9 …現像部材
- 10 …中間転写ベルト
- 11 …一次転写部材
- 12 …ベルト駆動ローラ
- 13 …ベルトクリーニング部
- 14 …定着部
- 15 …排紙部
- 16 …排紙積載部
- 17 …開閉ドア
- 50 …位置決め部
- 51, 52 …位置決め部

【図1】

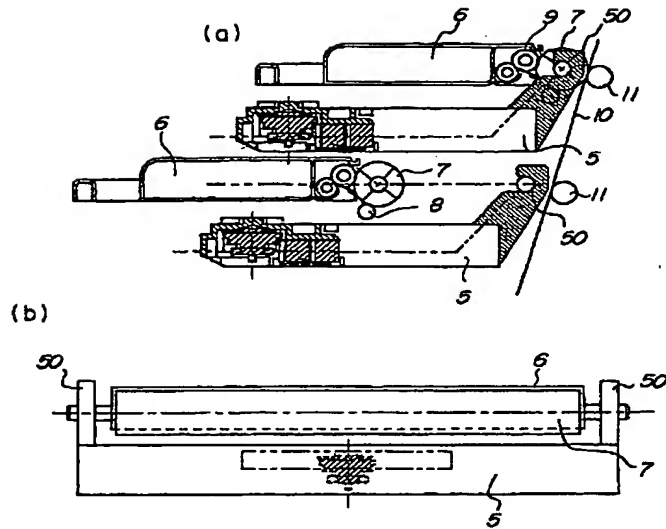


【図2】

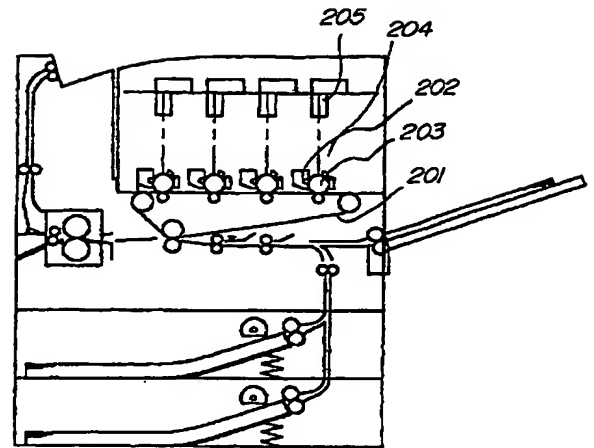


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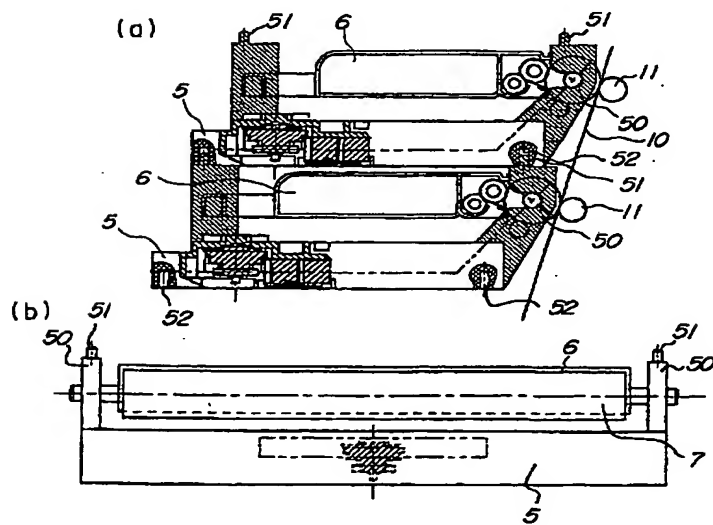
【図3】



【図7】

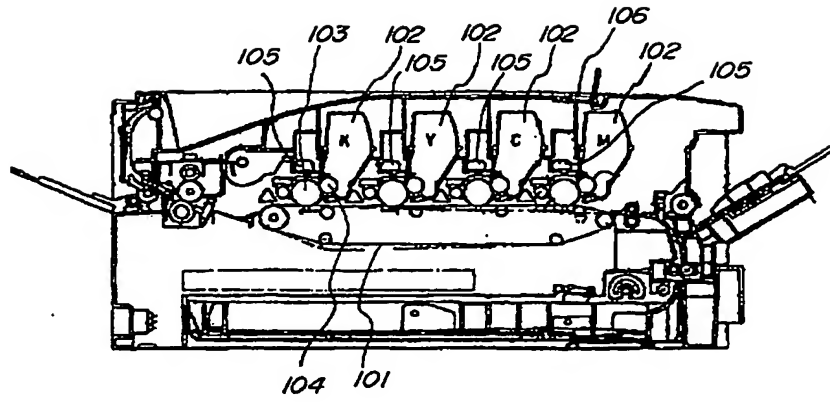


【図4】

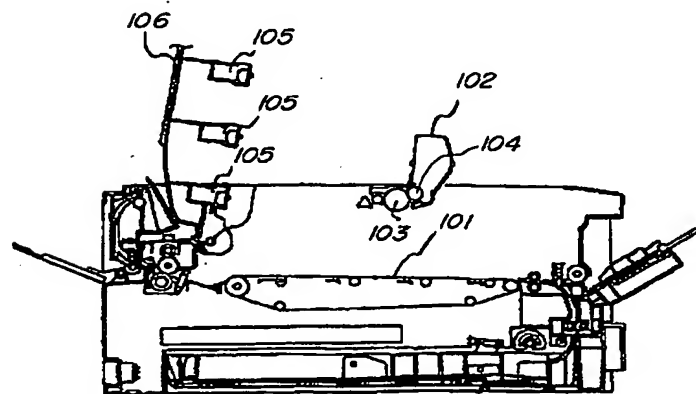


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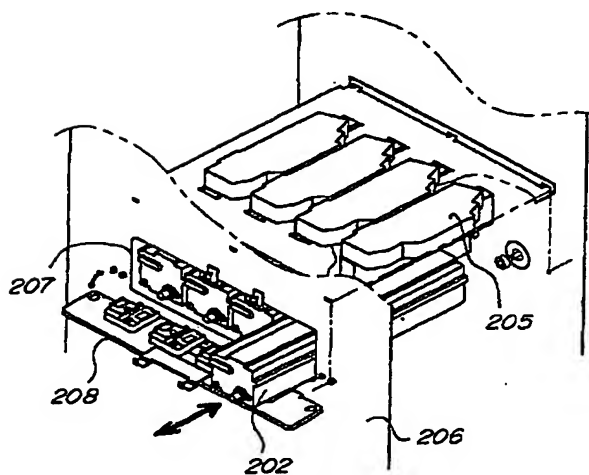
【図5】



【図6】



【図8】



PATENT ABSTRACTS OF JAPAN

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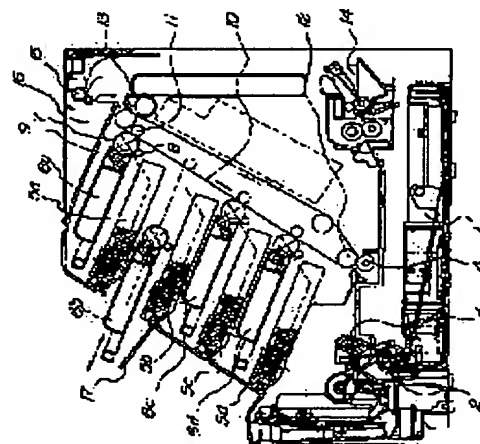
(22)Date of filing : 03.03.2000

(72)Inventor : INOMATA MITSUGI

(54) IMAGE FORMING DEVICE**(57)Abstract:**

PROBLEM TO BE SOLVED: To enable the exchange of an image carrier, a process cartridge or the like with a simple constitution without separating belts or making units movable, such as a exposure means requiring the feed of an electric power or a signal line, and to realize cost reduction and improvement in usability.

SOLUTION: The image forming device has a plurality of image carriers 7 (process cartridge 6) attachable to and detachable from the main body of the image forming device and a plurality of exposure means 5 to expose each image carrier surface, disposed and fixed on the main body of the image forming device corresponding to each image carrier 7. Each image carrier 7 is detachable from the side where a corresponding exposure means 5 is disposed in the direction which intersects nearly perpendicularly with the direction of the rotary shaft, without moving the exposure means 5 with respect to the main body of the image forming device.

**LEGAL STATUS**

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

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CLAIMS

[Claim(s)]

[Claim 1] Two or more exposure means to be placed in a fixed position to the body of image formation equipment by the body of image formation equipment corresponding to two or more removable image support and said each image support, and to expose each image support front face, It is image formation equipment which **** and is characterized by the removable thing from the side by which the exposure means which said each image support is the direction of a revolving shaft and a direction which carries out an abbreviation rectangular cross, without moving said exposure means to the body of image formation equipment, and corresponded has been arranged.

[Claim 2] Said image support is image formation equipment according to claim 1 which is contained in the process cartridge which has a development means in one at least, and is characterized by this process cartridge being removable to the body of image formation equipment.

[Claim 3] At the time of the desorption of said image support, it is image formation equipment according to claim 1 characterized by being the configuration which the middle imprint object which supports the image which countered with each image support and was formed in this image support does not move.

[Claim 4] Said each exposure means is image formation equipment according to claim 1 characterized by coming to form the positioning part of the image support corresponding to this.

[Claim 5] Said each exposure means is image formation equipment according to claim 1 characterized by coming to form the positioning part of the exposure means arranged adjacently.

[Claim 6] Two or more image formation sections which have the image support corresponding to said exposure means and this are image formation equipment according to claim 1 characterized by coming to be arranged from the equipment upper part stair-like towards the lower part.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to image formation equipment equipped with two or more image formation sections which consist of an exposure means, image support corresponding to this, etc.

[0002]

[Description of the Prior Art] The requests of the color printer in which high-speed printing is recent years more possible mount, and the color picture formation equipment which has arranged two or more image formation sections as shown below is put in practical use.

[0003] The 1st conventional example is shown in drawing 5 and drawing 6. The medium electrostatic adsorption conveyance belt 101 is arranged horizontally, two or more image formation sections (following process cartridge 102 (K: black, Y:yellow, C:cyanogen, M:Magenta)) which become juxtaposition from the image support 103 and a development counter 104 along with the top-face section are prepared removable, and the exposure means (LED) 105 is arranged corresponding to each image support 103. These exposure means 105 has composition separated as open actuation of the sheathing covering 106 prepared in the upper part of an equipment body possible [closing motion] shows to drawing 6 from said image support 103 with this covering 106. With this configuration, desorption of said each process cartridge 102 is carried out from an equipment top face in the open condition of said sheathing covering 106.

[0004] The 2nd conventional example is shown in drawing 7 and drawing 8. The middle imprint belt 201 (or medium electrostatic adsorption conveyance belt) is arranged horizontally, two or more image formation sections (following process cartridge 202) which become juxtaposition from the image support 203 and a development counter 204 along with the top-face section are prepared, and the exposure means (laser-beam scanner) 205 is being fixed to the body of equipment corresponding to each image support 203. As shown in drawing 8, while the opening 207 for the desorption of said process cartridge 202 is formed in one side plate 206 of the body of equipment and plugging up said opening 207 further, the door member 208 which has positioning of said process cartridge 202 and an attaching part is formed possible [closing motion]. With this configuration, after said belt 201 is estranged from said each image support 202, desorption of said each process cartridge 202 is carried out at a level [body / of equipment] with the longitudinal direction (the drawing 8 Nakaya mark direction) of the image support 203.

[0005]

[Problem(s) to be Solved by the Invention] However, in the conventional example of the above 1st, the power source and signal line to the exposure means (LED) 105 opened and closed by the body of equipment by the sheathing covering 106 prepared in closing motion and one must be supplied, and it becomes a cost rise. Moreover, a belt 101 is exposed in the case of exchange of each process cartridge, and there are problems, such as damaging this belt 101 at the time of exchange actuation.

[0006] Moreover, in the conventional example of the above 2nd, since it is fixed to the body of equipment, the exposure means 205 needs to estrange the image support 203 and the belt 201 of this process cartridge 202 at the time of exchange of each process cartridge, and serves as a cost rise. Moreover, since it is the configuration which serves as positioning maintenance criteria of the image support 202, and makes desorption of a process cartridge 202 possible by carrying out opening (opening 207) of the side plate 206, there are problems, such as a fall of positioning accuracy, a fall of maintenance rigidity, and a fall of user BIIRITI at the time of desorption.

[0007] Then, this invention is made in view of the above-mentioned technical problem, exchange of the image

formation sections, such as a process cartridge, is enabled with a simple configuration, without the place made into the purpose estranging a belt, or making movable units, such as power and an exposure means being supplied [of a signal line], and it is shown in aiming at cost cut and improvement in user BIIRITI.

[0008]

[Means for Solving the Problem] The typical configuration of this invention for attaining the above-mentioned purpose Two or more exposure means to be placed in a fixed position to the body of image formation equipment by the body of image formation equipment corresponding to two or more removable image support and said each image support, and to expose each image support front face, It ****, and said each image support is characterized by the removable thing from the side by which the exposure means which are the direction of a revolving shaft and the direction which carries out an abbreviation rectangular cross, and corresponded has been arranged, without moving said exposure means to the body of image formation equipment.

[0009] Furthermore, said image support is contained in the process cartridge which has a development means in one at least, and, specifically, this process cartridge is characterized by the removable thing to the body of image formation equipment.

[0010] Furthermore, it is characterized by being the configuration which the middle imprint object which supports the image which countered with each image support and was formed in this image support does not move at the time of the desorption of said image support.

[0011] Without according to the above-mentioned configuration, estranging image support and middle imprint objects, such as a belt which countered, or making movable units, such as power and an exposure means being supplied [of a signal line], exchange of the process cartridge which contains image support or this with a simple configuration is possible, and it is possible to aim at cost cut and improvement in user BIIRITI.

Moreover, opening in that case is also small and middle imprint objects, such as said belt, do not expose it.

[0012] Moreover, since said each exposure means has it come to form the positioning part of the image support corresponding to this, adjustment between this exposure means and image support is [an exposure means simple substance] possible for it, and it can plan improvement in positioning accuracy, and the adjustment needlessness at the time of the whole equipment assembly.

[0013] Moreover, since said each exposure means has it come to form the positioning part of the exposure means arranged adjacently, the physical relationship between each exposure means is decided with the exposure means itself, and it can plan the improvement in precision between each image formation section which consists of this exposure means, image support corresponding to this, etc., and the adjustment needlessness at the time of the whole equipment assembly.

[0014] Moreover, since it comes to be arranged from the equipment upper part stair-like towards the lower part, two or more image formation sections which have the image support corresponding to said exposure means and this are each image support (or the upper part or the lower image formation section does not become obstructive at the time of exchange of the process cartridge containing image support, and easy exchange is attained.).

[0015]

[Embodiment of the Invention] Hereafter, with reference to a drawing, 1 operation gestalt of the image formation equipment which applied this invention is explained to a detail.

[0016] The [1st operation gestalt] With reference to drawing 1, the image formation equipment concerning the 1st operation gestalt of this invention is explained in detail. Drawing 1 is the outline block diagram of the image formation equipment concerning the 1st operation gestalt.

[0017] One record medium, such as a record sheet set to the sheet paper cassette 1, is sent out at a time by the pickup member 2. After this record medium has that skew amended, it is conveyed by the resist roller section 3 at the secondary imprint section.

[0018] In the image formation section, the exposure means 5a, 5b, 5c, and 5d are arranged as shown in one field of the middle imprint belt 10 at drawing 1, and corresponding to each exposure means 5a, 5b, 5c, and 5d, process cartridges 6a, 6b, 6c, and 6d are formed. In each process cartridges 6a, 6b, 6c, and 6d, it is charged by the primary electrification member 8, a latent image is formed by the exposure means 5, and image support 7 is developed-image-ized by the development member 9.

[0019] Thus, the heavy imprint of the toner image of two or more colors formed in each image formation section is carried out one by one on said middle imprint belt 10 by each image support 7 and the primary imprint member 11 which countered. The multicolor toner image which was imprinted in piles by this middle

imprint belt 10, and was formed in it is secondarily imprinted on a record medium by the secondary imprint member 4 in the secondary imprint section mentioned above.

[0020] Here, the secondary transfer residual toners on said middle imprint belt 10 are collected by the belt cleaning section 13.

[0021] Moreover, the rotation drive of said middle imprint belt 10 is carried out in the direction of an arrow head of drawing 1 by the belt driving roller 12.

[0022] It is fixed to the record medium with which the package imprint of the multicolor toner image on said middle imprint belt 10 was carried out in the fixing section 14, and it is discharged by the delivery loading section 16 of the equipment upper part by the delivery unit 15.

[0023] Two or more exposure means 5a, 5b, 5c, and 5d arranged corresponding to said each image support 7 are being fixed to the body of image formation equipment, respectively. And each process cartridges 6a, 6b, 6c, and 6d which have said image support 7 are removable from the side by which the exposure means 5 which is the direction (the drawing 1 Nakaya mark direction) which intersects perpendicularly with the shaft orientations which are in a condition [that said exposure means 5 is fixed to the body of image formation equipment, respectively], and are the center of rotation, and corresponded has been arranged.

[0024] Moreover, it has composition which the middle imprint belt 10 which supports the image which countered with each image support 7 and was formed in this image support 7 does not move at the time of the desorption of the process cartridge 6 which has said image support 7.

[0025] Namely, as this operation gestalt shows to drawing 1 , desorption is independent and possible for said process cartridge 6, without [without it moves the exposure means 5 from the closing motion door 17 prepared for every process cartridge, and] moving the middle imprint belt 10.

[0026] As mentioned above, according to this operation gestalt, each process cartridges 6a, 6b, 6c, and 6d which have the image support 7 Without moving the exposure means 5a, 5b, 5c, and 5d to the body of image formation equipment, respectively, from the side by which the exposure means 5 which are the direction of a revolving shaft and the direction (the drawing 1 Nakaya mark direction) which carries out an abbreviation rectangular cross, and corresponded has been arranged, since it is removable Without estranging the image support 7 and the middle imprint belt 10 which countered, or making movable the unit of exposure means 5 grade [need / power or a signal line / to be supplied] Exchange of the process cartridge 6 which has the image support 7 with a simple configuration is possible, and it is possible to aim at cost cut and improvement in user BIIRITI. Moreover, opening in that case is also small, and it leads also to improvement in dependability, without said middle imprint belt 10 being exposed.

[0027] Moreover, with this operation gestalt, as shown in drawing 1 , two or more image formation sections which consist of said exposure means 5 and said process cartridge 6 are arranged stair-like towards the lower part from the equipment upper part, and the image formation section of an upper case becomes obstructive at the time of the desorption of the process cartridge 6 of the lower berth.

[0028] In addition, it is not necessary to limit to this, and the include angle is good [with this operation gestalt, as shown in drawing 1 , the image formation section and said middle imprint belt 10 are arranged aslant, but], if it sets up suitably if needed (even when it is perpendicular and level).

[0029] The [2nd operation gestalt] With reference to drawing 2 , the image formation equipment concerning the 2nd operation gestalt of this invention is explained in detail. Drawing 2 is the outline block diagram of the image formation equipment concerning the 2nd operation gestalt. In addition, the same sign is given to the member which has the same function as the operation gestalt mentioned above, and detailed explanation is omitted.

[0030] With the image formation equipment concerning the 2nd operation gestalt shown in drawing 2 , the image formation section for every color is arranged at right and left of the middle imprint object belt 10. And each exposure means 5a, 5b, 5c, and 5d are being fixed to the body of equipment like the 1st operation gestalt, and the desorption to the drawing 2 Nakaya mark direction is independently possible for each process cartridges 6a, 6b, 6c, and 6d respectively.

[0031] In addition, although the configuration which allotted two sets of image formation sections to each right and left of the middle imprint belt 10 is illustrated with this operation gestalt, it may not be limited to this and 3 to 1 grade is sufficient. The black image formation section it is assumed to be in that case that there is much amount used may be allotted to 1 set side, and capacity of the image formation section of this black may be

made larger than other three things (yellow, a Magenta, cyanogen).

[0032] The [3rd operation gestalt] With reference to drawing 3 , the image formation equipment concerning the 3rd operation gestalt of this invention is explained in detail. Drawing 3 is the important section block diagram of the image formation equipment concerning the 3rd operation gestalt. In addition, the same sign is given to the member which has the same function as the operation gestalt mentioned above, and detailed explanation is omitted.

[0033] As shown in drawing 3 , with the 3rd operation gestalt, the positioning section 50 by which the image support 7 of the process cartridge 6 corresponding to this is positioned is formed in each exposure means 5, respectively. Here, the exposure means 5 is the unit simple substance, and the exposure location of the laser etc. is adjusted to the positioning section 50 on the assumption that the image support 7 is positioned. Highly precise positioning of the exposure means 5 and the image support 7 is attained by this, and the adjustment at the time of the whole equipment assembly also becomes unnecessary further.

[0034] The [4th operation gestalt] With reference to drawing 4 , the image formation equipment concerning the 4th operation gestalt of this invention is explained in detail. Drawing 4 is the outline block diagram of the image formation equipment concerning the 4th operation gestalt. In addition, the same sign is given to the member which has the same function as the operation gestalt mentioned above, and detailed explanation is omitted.

[0035] As shown in drawing 4 , with the 4th operation gestalt, the positioning section 50 by which the image support 7 of the process cartridge 6 corresponding to this is positioned is formed in each exposure means 5, respectively. Moreover, the positioning sections 51 and 52 which perform positioning with other exposure means 5 established adjacently, respectively are formed in each exposure means 5. Thereby, improvement in a relative location precision between each exposure means 5 is attained. Furthermore, like the operation gestalt mentioned above, highly precise positioning between the exposure means 5 and the image support 7 is attained, and the adjustment at the time of the whole equipment assembly also becomes unnecessary.

[0036] Operation gestalt] besides [Although the case where it was the middle imprint object (middle imprint belt) with which the member arranged in the opposite location of each image support supports the image formed in each image support with the operation gestalt mentioned above was illustrated In order to imprint in piles the image which is not limited to this, either, for example, was formed in each image support one by one to a record medium, the same effectiveness is expectable even if it applies this invention to the image formation equipment using the record-medium support (electrostatic adsorption conveyance belt etc.) which carries out support conveyance of the record medium.

[0037] Moreover, with the operation gestalt mentioned above, although the printer was illustrated as image formation equipment, this invention is not limited to this, may be other image formation equipments, such as a compound machine with which a copying machine, facsimile, or these functions were put together, and can acquire the same effectiveness by applying this invention to this image formation equipment.

[0038] Moreover, although the process cartridge which has in one an electrification means as a process means to act on this, and a development means was illustrated as image support to image formation equipment with the operation gestalt mentioned above as a process cartridge which can be detached and attached freely, this invention is not limited to this. For example, the same effectiveness can be acquired by applying this invention to the image formation equipment which may be the process cartridge of other configurations, such as a process cartridge except an electrification means, or a process cartridge which added the cleaning means, and was equipped with this process cartridge free [attachment and detachment] from said configuration.

[0039] Furthermore, even if an image support simple substance is in the equipment of a removable configuration, the same effectiveness can be acquired by applying this invention.

[0040]

[Effect of the Invention] As explained above, according to this invention, each image support In the condition [that the exposure means corresponding to this is fixed to the body of image formation equipment] From the side by which the exposure means which is the direction which intersects perpendicularly with the shaft orientations which are the center of rotation, and corresponded has been arranged, since it is removable For example, without estranging image support and middle imprint objects, such as a belt which countered, or making movable units, such as power and an exposure means being supplied [of a signal line] Exchange of image support (or process cartridge containing this) is possible with a simple configuration, and cost cut and improvement in user BIIRITI can be aimed at. Moreover, opening in that case is also small, and it leads also to

improvement in dependability, without middle imprint objects, such as said belt, being exposed.

[0041] Moreover, since each exposure means has it come to form the positioning part of the image support corresponding to this, adjustment between this exposure means and image support is [an exposure means simple substance] possible for it, it can plan improvement in positioning accuracy, and the adjustment needlessness at the time of the whole equipment assembly, and effectiveness is in improvement and a cost cut of printing precision (image quality).

[0042] Moreover, since each exposure means has it come to form the positioning part of the exposure means arranged adjacently, the physical relationship between each exposure means is decided with the exposure means itself, it can plan the improvement in precision between each image-formation section which consists of this exposure means, image support corresponding to this, etc., and the adjustment needlessness at the time of the whole equipment assembly, and effectiveness is in improvement and a cost cut of printing precision (image quality).

[0043] Moreover, since it comes to arrange two or more image formation sections which have an exposure means and the image support corresponding to this from the equipment upper part stair-like towards the lower part, the upper part or the lower image formation section does not become obstructive at the time of exchange of each image support (or process cartridge containing image support), the easy exchange of them is attained, and effectiveness is in improvement in user BIIRIITI.

[Translation done.]

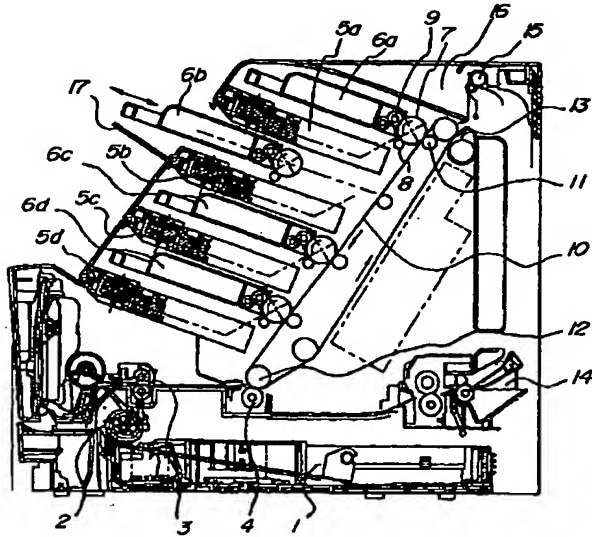
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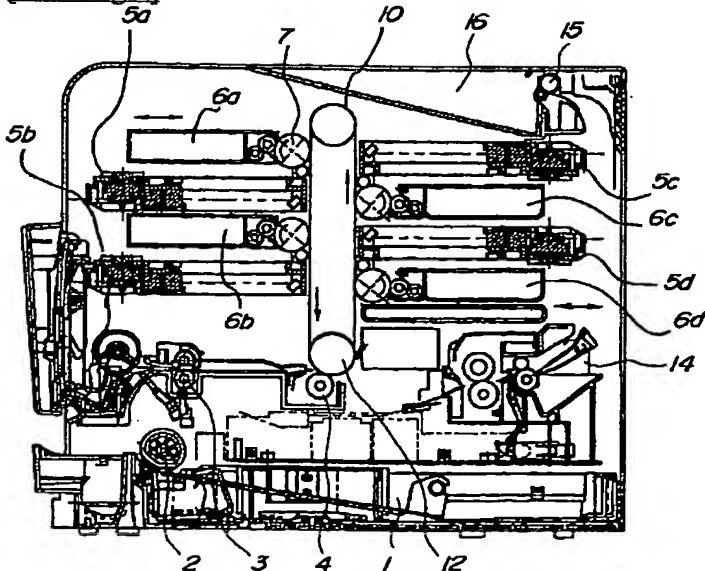
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DRAWINGS

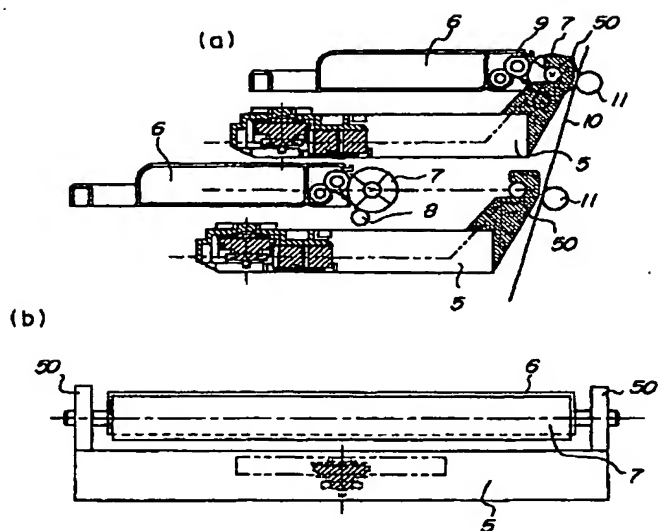
[Drawing 1]



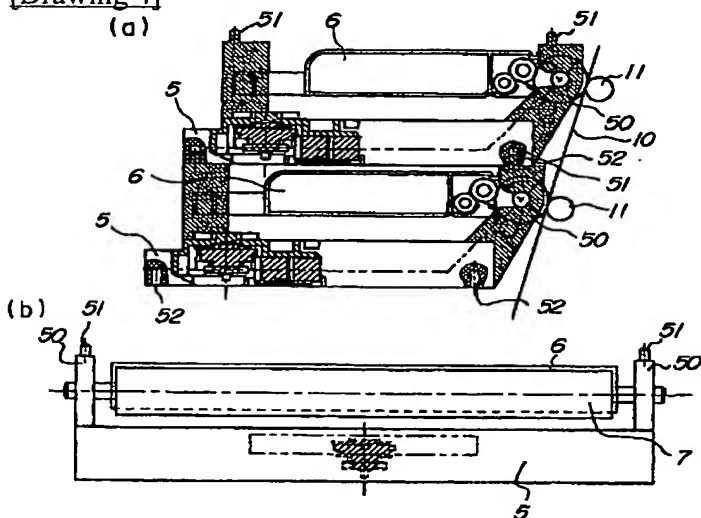
[Drawing 2]



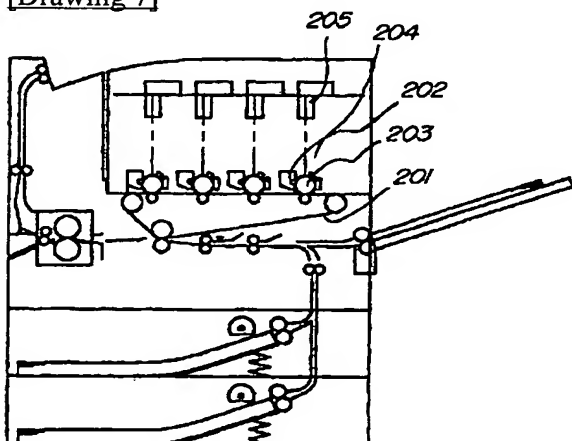
[Drawing 3]



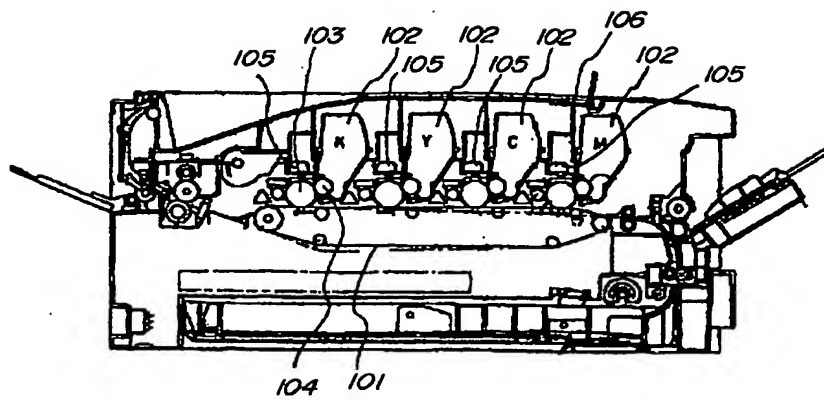
[Drawing 4]



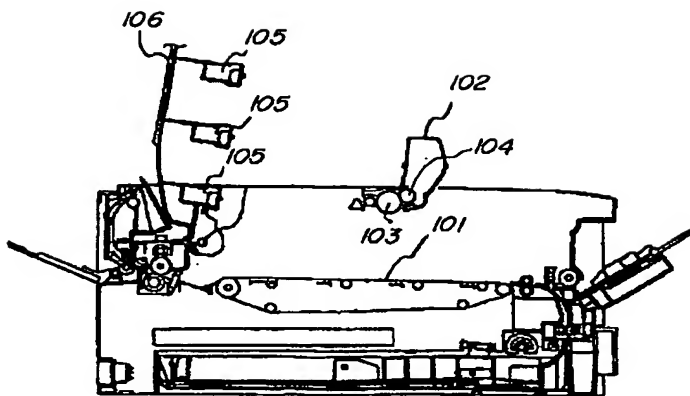
[Drawing 7]



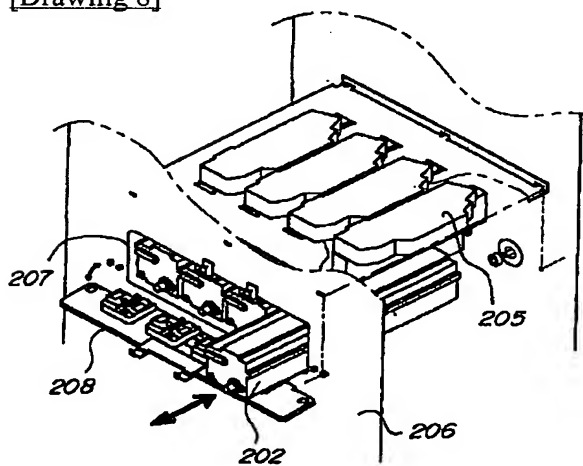
[Drawing 5]



[Drawing 6]



[Drawing 8]



[Translation done.]